(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 2 944 714 A2**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
18.11.2015 Bulletin 2015/47

(51) Int Cl.:
D01H 13/16 *(2006.01)*

(21) Application number: **14404002.9**

(22) Date of filing: **14.08.2014**

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME

(30) Priority: **16.08.2013 TR 201309810**

(71) Applicant: **Elecmag Elektromanyetik Selenoid Makina Imalat Sanayi Ve Ticaret Limited Sirketi**
Ankara (TR)

(72) Inventor: **Burcu, Apak**
Ankara (TR)

(54) **SUCTION DEVICE FOR RING SPINNING MACHINE**

(57) The invention is concerned with an energy saving pneumatic suction mechanism (1) and an energy conservation method, the mechanism comprising a suction nozzle (4) through which the vacuum process is carried out, a machine intake section (5) that conveys the vacuumed spindle to the machine during the vacuum process, a valve chamber (4) that allows for the intervention, and a solenoid housing (2) containing a solenoid (2.1) and an energy input (2.2) positioned to allow energy intake to the said solenoid (2.1).

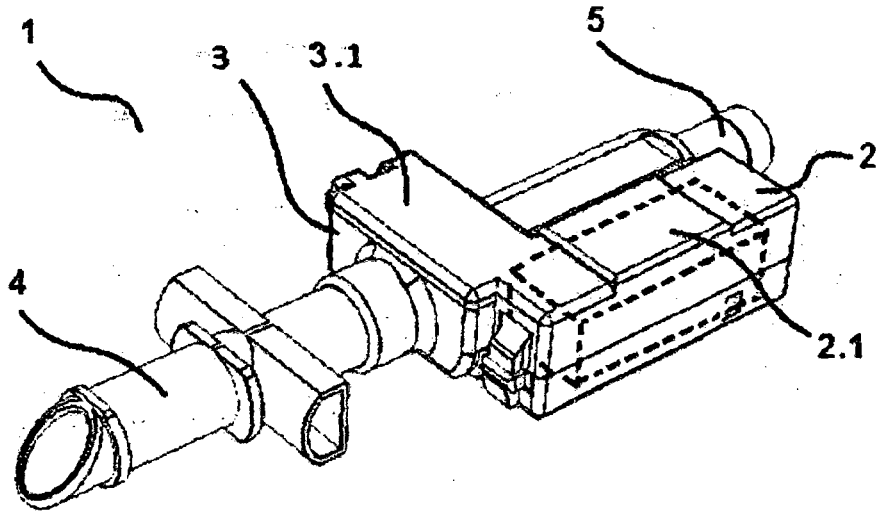

Fig. **1**

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Description

Technical Field

[0001] The invention is concerned with an innovation made in the pneumophile mechanism in vater (ring) spinning machines that has to be vacuumed continuously and the energy conservation made possible by the said innovation.

Known Status of the Technique

[0002] In the known status of the technique; in the vater (ring) spinning machines, connected to the pneumophile mechanism and situated just under the front drafting roller, there are holes aligned at the same level with each spindle. Air is continuously suctioned through these holes. In case the yarn breaks for whatever reason, the fibers that are the raw material output due to the drafting in are suctioned into this hole. Therefore, the occurrence of a situation where the fibers wrap around and clog the front drafting roller, hindering its operation, is prevented. These suctioned fibers are taken out from the collection bin situated at the machine headstock by the person who takes care of the machine. In order not to allow any decrease in the suction power, this collection bin is frequently cleaned.

[0003] In the known status of the technique; the continuous vacuuming of the rove and the yarn in the vater (ring) spinning machines is aimed at the prevention of any problems that may occur in the yarn and the machine. However, in this solution, the vacuum has no function within the duration during which the rove is twisted to form the yarn as the suctioning of the rove is only needed in the event that the yarn breaks and there is a needless suction as a prevention measure against the possibility of yarn breaking.

[0004] In the known status of the technique, a number of solutions were sought out in order to prevent the wasting of yarn and the damages brought about to the machines by these wastes. Among these, some are the solutions made on the yarn raw material. In order to prevent the mentioned wasting, some techniques / solutions were tried with the purpose of increasing the strength of the raw material.

[0005] In the known status of the technique, in the vater (ring) spinning machines, the continuous vacuuming by the machines leads to high levels of energy consumption by the machine.

[0006] In the present technique; a sample of the systems developed in order to prevent the decrease in the said vacuum power is the patent application / certificate with the application number TR 2006/06908 titled "Pneumatic yarn tensioner and yarn processing system." The abstract of this application herewith is briefly summarized as follows. *"In a pneumatic yarn tensioner (T) for a pinch gripper shuttle machine or for a knitting machine, the air flow channeling face (19) set forth in order for the channeling of the yarn (Y, Y1), forms an intransitive extension (12) of the inner wall of the flat guide channel through which the yarn passes. In a yarn processing system (S), a mechanism (H) is set forth in order for the adjustment of the flow rates or air flow pressure along the channeling face of the pneumatic yarn tensioner (T), between at least two different levels and in compliance with the operating cycle of the textile machine.*"

[0007] In the present technique; a sample aiming at attaining energy recovery in the mentioned spinning machines by means of adjusting the said vacuum is the patent application / certificate with the application number TR 97/01595 titled "The adjustment of the air suction device of the textile machinery." The abstract of this application herewith is briefly summarized as follows. *"As per the invention, it is proposed that the suctioning power of a suction collector of the air suction device connected to energy and a result oriented textile machine at maximum capacity is, after starting a yarn batch with the previously adjusted vacuum and in the previously designated time frame, counting the number of unresolved problems and troubleshooting efforts arising in basic jobs and needs out of excessive vacuum, which will later change the suctioning power of the suction collector and thus the number of problems determined that occurred in the next time frame will be compared to the problems that took place in the previous time frame,* and *as such, in case of a difference in the number of errors that exceeds the maximum number of errors previously determined, the higher suctioning power, otherwise, the lower, will be selected."*

[0008] As a result, due to the negative aspects mentioned above and because of the incapability of the existing solutions against the subject matter, an innovation is necessitated in order to prevent the high level energy consumption arising out of the said vacuum in the vater (ring) spinning machines.

Brief Explanation of the Invention

[0009] The present invention is concerned with the energy saving pneumophile suction mechanism and energy conservation method in vater (ring) spinning machines, which meets the requirements mentioned above, removes all the disadvantages, and brings in some additional advantages.

[0010] The purpose of the invention is to prevent the high levels of energy consumption in vater (ring) spinning machines due to the continuous vacuuming by the machines.

[0011] One purpose of the invention is, when fibers, as a raw material, is wasted in the spinning machines, in case the said vacuum power cannot process the remaining fiber back into the system, to prevent the futile operation of the related vacuum section of the machines.

[0012] Another purpose of the invention is, in vater (ring) spinning machines, as there is no suction in the entire machine with the breaking of a yarn in the said pneumophile tubes, to operate the suction only in the

spindle where the breaking occurs and thus vacuum more efficiently, which brought about an exact solution to prevent rove wrapping around the front roller and coupling. This prevented the machine from any harm and also removed the need for cleaning labor.

[0013] The structural and characteristic features of the invention and all its advantages shall be more clearly understood by means of the figures provided below and the detailed explanation written up with references made to these figures, and therefore, the assessment should be made by taking into consideration these figures and the detailed explanation.

Figures to help understand the Invention

[0014] The "energy saving pneumophile suction mechanism and energy conservation method in Vater (ring) spinning machines" that is the subject of our patent application herewith are displayed in the accompanying figures which are as follows;

Figure 1 : This is the perspective view of the energy saving pneumophile suction mechanism in Vater (ring) spinning machines that is the subject of the invention.

Figure 2 : This is the perspective view of an alternative build of the energy saving pneumophile suction mechanism in Vater (ring) spinning machines that is the subject of the invention.

Figure 3 : This is the perspective view of an alternative build of the energy saving pneumophile suction mechanism in Vater (ring) spinning machines that is the subject of the invention.

Figure 4 : This is the figure displaying the steps of procedure required for the energy saving pneumophile suction mechanism in Vater (ring) spinning machines that is the subject of the invention to save energy

[0015] The drawings do not necessarily require scaling and the details that are not needed to understand the present invention may be ignored otherwise. Furthermore, at least the members which are largely identical or at least those that have largely identical functions are displayed with the same number.

Explanation of the Part References

[0016] As the subject of our utility model application in question, our invention titled "Energy saving pneumophile suction mechanism in Vater (Ring) Spinning Machines and energy conservation method" is enumerated as seen in the accompanying figures, and the names of the parts corresponding to these numbers are provided below.

1. Energy saving pneumophile suction mechanism in Vater (Ring) Spinning Machines

2. Solenoid housing

2.1 Solenoid
2.2 Energy input

3. Vacuum on off chamber

3.1 Vacuum on off valve

4. Suction nozzle
5. Machine intake section

Explanation of the Steps of Procedure

[0017]

101. Via the continuous retention of the vacuum motor at idle, the transmission of the vacuum up to the energy saving pneumophile suction mechanism
102. Gradual increase of the vacuum as necessary
103. Turning off of the vacuum when not needed
104. In the event of breaking of any one of the spindles, the opening of the system via the transmission of this data of breaking with the help of the sensors
105. With the opening of the system, the retention of the system at the stand by state by a member of the personnel through readjusting the spindle in the pneumophile suction mechanism

Detailed Explanation of the Invention

[0018] In this detailed explanation, the preferred builds of the innovation made in the energy saving pneumophile suction mechanism and the energy conservation method in Vater (ring) spinning machines, are explained only to provide a better understanding of the subject matter and in a manner that does not pose any restrictive effect.

[0019] The invention is concerned with the energy saving pneumophile suction mechanism in Vater (ring) spinning machines (1) and the energy conservation made possible by means of the mentioned mechanism in question.

[0020] The energy saving pneumophile suction mechanism (1) that is the subject of the invention is comprised of; the suction nozzle (4) through which the said vacuum process is carried out, the machine intake section (5) that conveys the vacuumed spindle to the machine during the vacuum process, the valve chamber (3) that allows for the intervention, the valve that turns the vacuuming on and off (3.1) and the solenoid housing (2) containing solenoid (2.1) and the energy input (2.2) positioned to allow energy intake to the said solenoid (2.1).

Energy saving :

[0021] The mentioned energy saving is realized as follows. The vacuum motor that operates continuously in the present technique is not required to operate contin-

uously in full capacity in the system to which the energy saving pneumophile suction mechanism (1) that is the subject of the invention is connected. This, on the other hand, shall occur by means of installing an inverter to the vacuum motor, retaining it at a 95 % low performance. By means of the vacuum measurement sensor installed on to the vacuum on off chamber (3) the required suction power is measured, the motor operating performance shall be increased and the suction shall operate, which shall only take place in the event that a number of spindle breaks occur, while at other times, by means of the motor operating at retention, the said energy conservation shall be attained.

[0022] The moving cap on the pneumophile suction mechanism is always at closed state only in the case of spindle breaking, it will be opened by means of the sensor and the suction will begin, even if some of the spindles break, the power of the vacuum motor will be sufficient at the idle state, however, after about 50 spindle breaks, by means of the sensor on the vacuum on off chamber (3), the necessary increase will be attained at the same rate with the breaking of each spindle breaking but it will shift to full performance only with the breaking of 95 % of the spindles, which, in turn, will provide a controlled energy conservation.

[0023] The solenoid housing (2) situated within the pneumophile suction mechanism harbors the solenoid (2.1)

[0024] The Solenoid (2.1) turns the vacuum on off valve (3) on or off, according to the data transmitted by the yarn and clasp tracking sensor.

[0025] The vacuum on off chamber (3) harbors the moving vacuum on off valve (3.1).

[0026] The vacuum on off valve (3.1) assists the operation of the vacuum motor at retention by keeping the main suction tube closed until data is transmitted from the yarn and clasp tracking sensor and allows for the suction process by opening only at the time of breaking.

Claims

1. The invention is the energy saving pneumophile suction mechanism (1) used in Vater (ring) spinning machines containing the suction nozzle (4) through which the said vacuum process is carried out, the machine intake section (5) that conveys the vacuumed rove to the machine during the vacuum process; and its characteristics is the included valve chamber (3) that allows for the intervention, the valve that turns the vacuuming on and off, the vacuum on off valve situated on the chamber (3.1), and the solenoid housing (2) containing solenoid (2.1) and the energy input (2.2) positioned to allow energy intake to the said solenoid (2.1).

2. It is the energy saving pneumophile suction mechanism (1) in compliance with Claim 1, the characteristics of which is that the said energy saving pneumophile suction mechanism (1) is made of plastic material.

3. It is the energy saving pneumophile suction mechanism (1) in compliance with Claim 1, the characteristics of which is that it contains the electronic control system that transmits the energy and yarn status data to the said energy input (2.2).

4. **It is** the energy saving pneumophile suction mechanism (1) in compliance whit Claim 1, the characteristics of which is that the said vacuum on off chamber (3) contains vacuum measurement sensor.

5. The invention is the energy saving pneumophile suction mechanism in Vater (ring) spinning machines, the characteristics of which is;

   - Via the continuous retention of the vacuum motor at idle, the transmission of the vacuum up to the energy saving pneumophile suction mechanism (101)
   - Gradual increase of the vacuum as necessary (102)
   - Turning off of the vacuum when not needed (103)
   - In the event of breaking of any one of the spindles, the opening of the system via the transmission of this data of breaking with the help of the sensors (104)
   - With the opening of the system, the retention of the system at the stand by state by a member of the personnel through readjusting the spindle in the pneumophile suction mechanism (105)

   These are the steps that are included in the procedure.

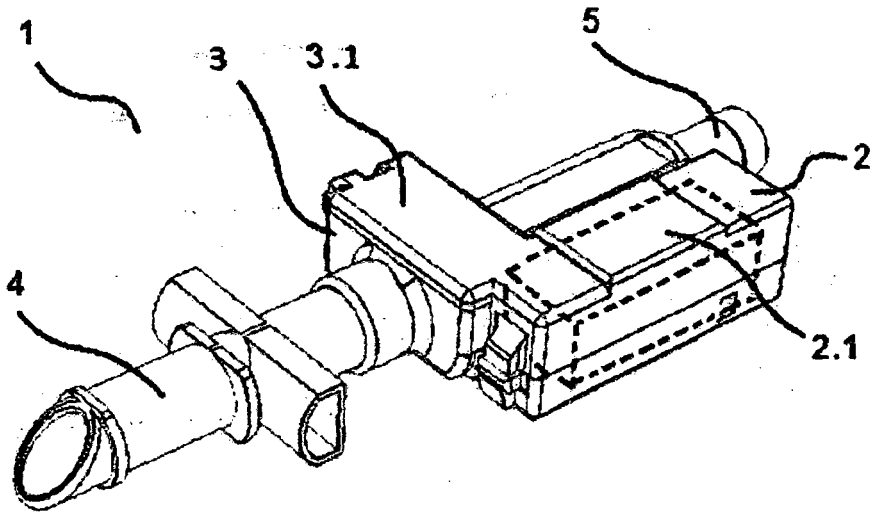

Fig. 1

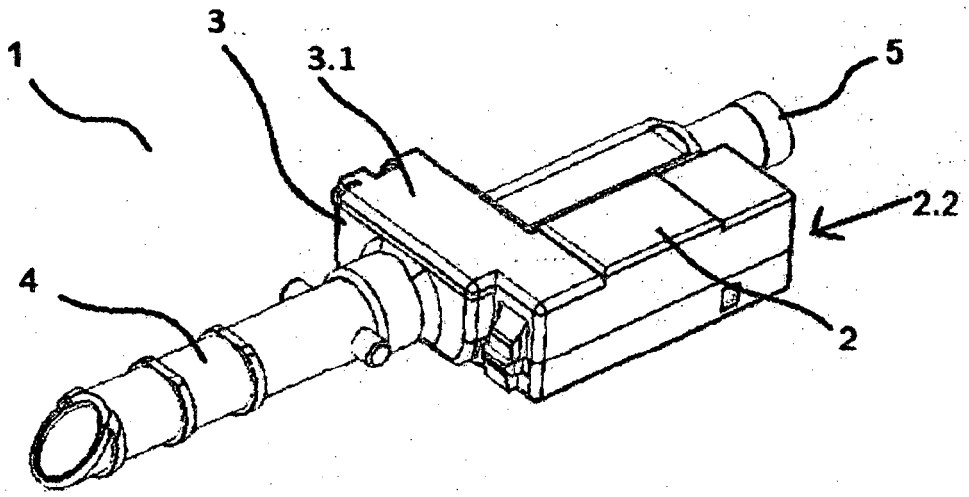

Fig. 2

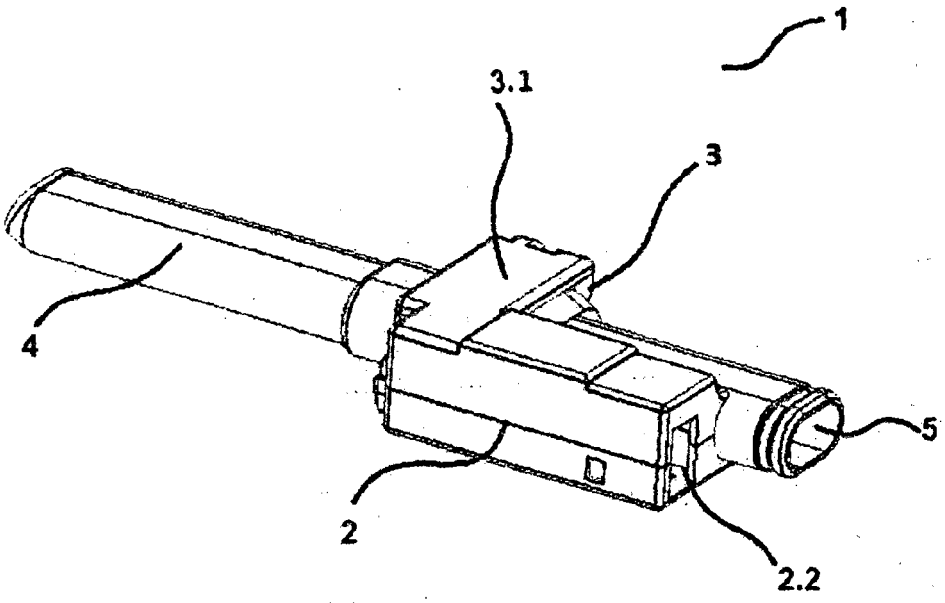

Fig. 3

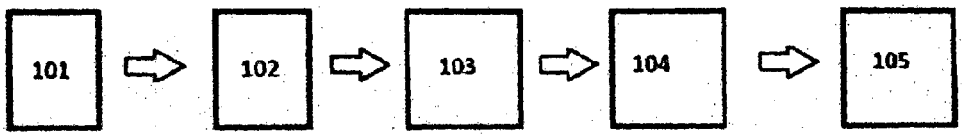

Fig. 4

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- TR 200606908 **[0006]**
- TR 9701595 **[0007]**